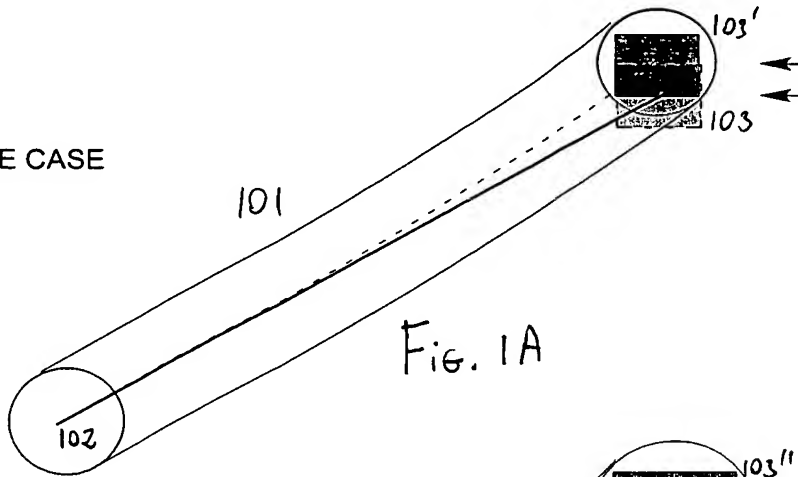
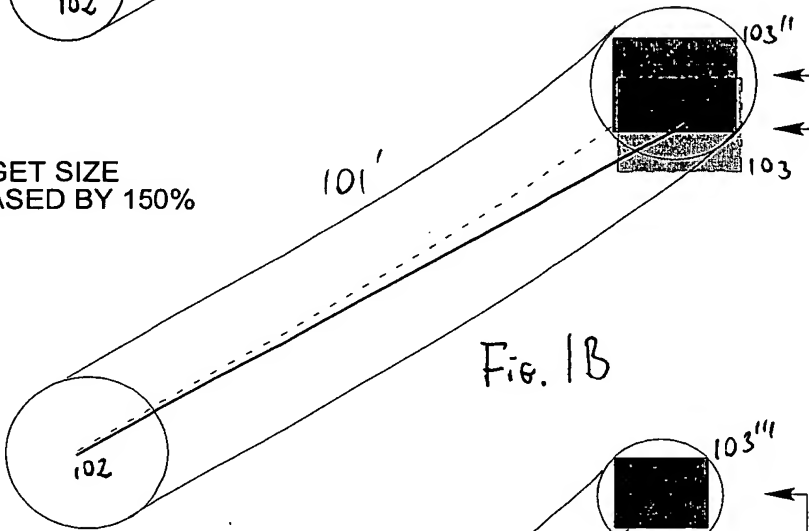


I. BASE CASE

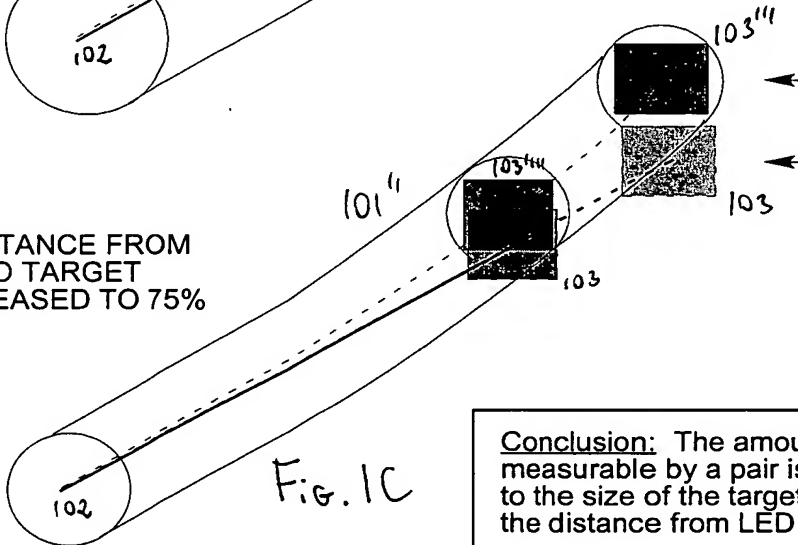


MAXIMUM
MEASURABLE
BEND IN TUBE

II. TARGET SIZE
INCREASED BY 150%



III. DISTANCE FROM
LED TO TARGET
DECREASED TO 75%



TOTAL BEND
OF TUBE
WITH MAXIMUM
DISPLACEMENT
AT TARGET

Conclusion: The amount of bend measurable by a pair is proportional to the size of the target divided by the distance from LED to target.

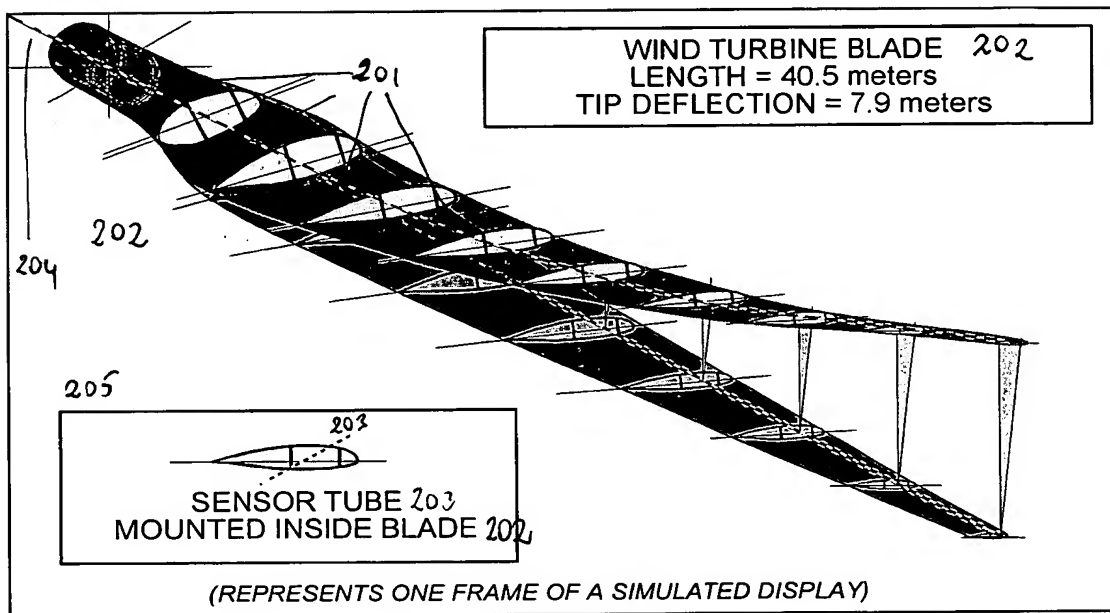


FIG. 2: ISOMETRIC VIEW OF WINDMILL BLADE
WITH THE SENSOR TUBE AND EXTERNAL DISPLAY

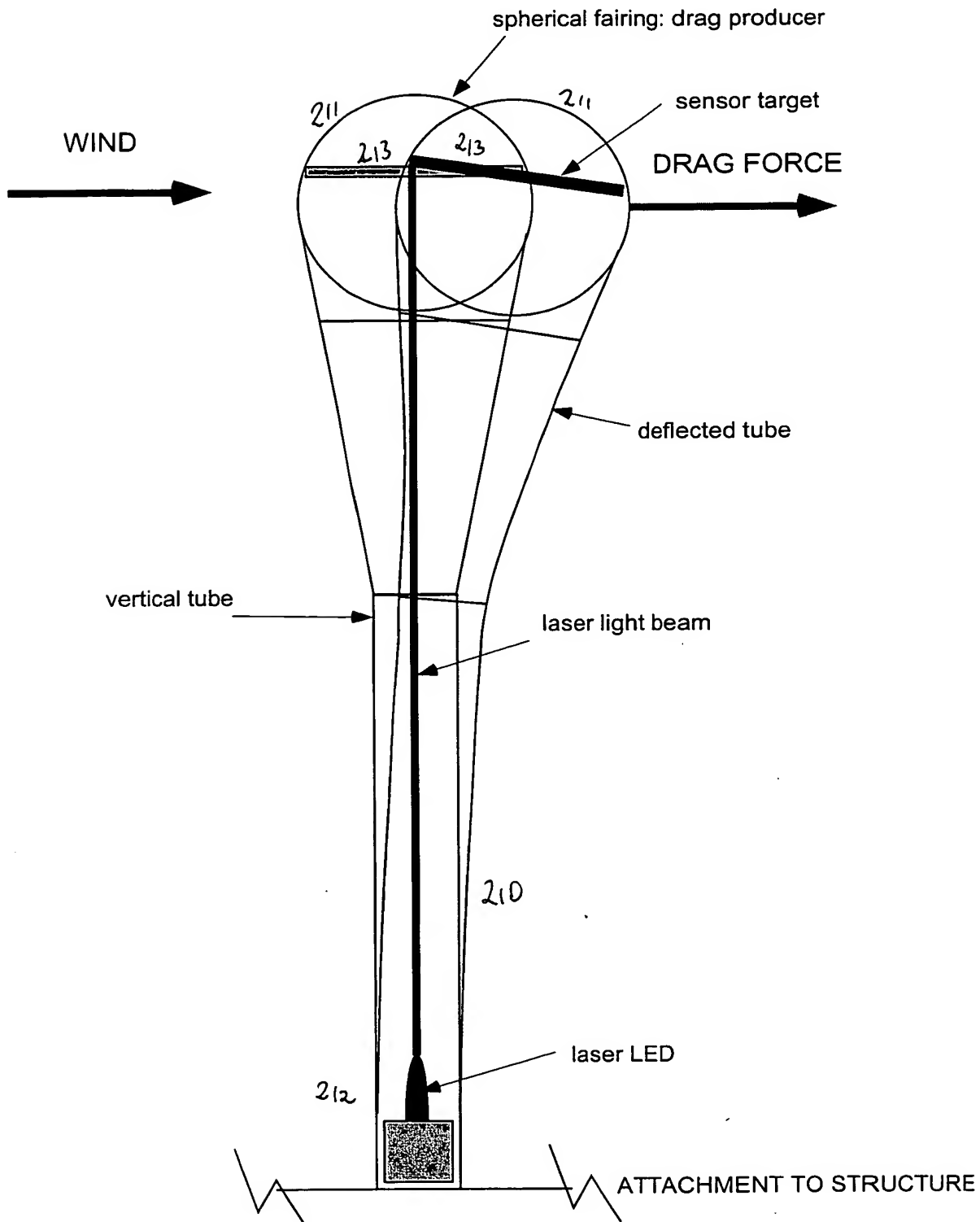


FIGURE 2a: ANEMOMETER DESIGN

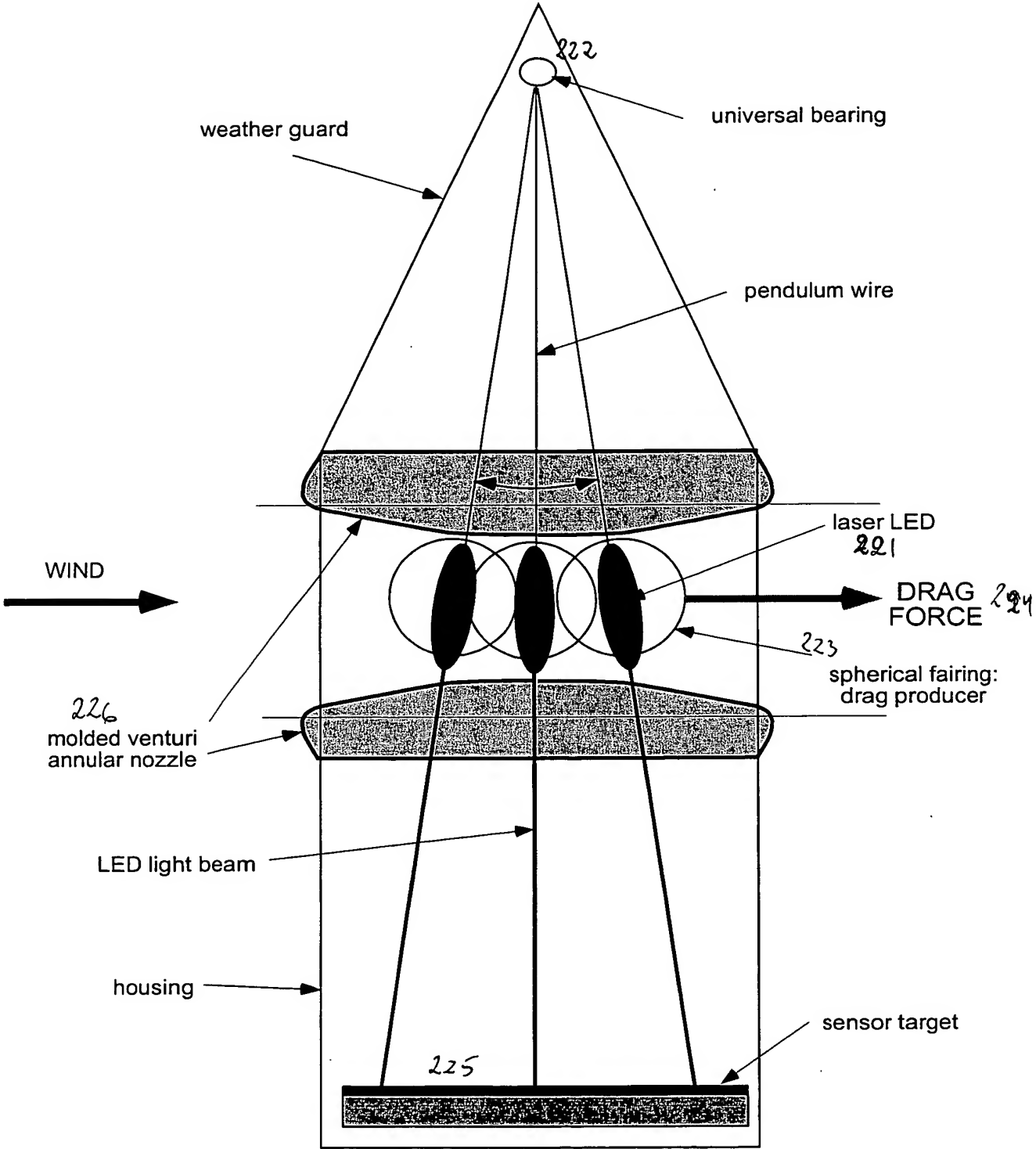


FIGURE 2b: ANEMOMETER DESIGN ALTERNATE

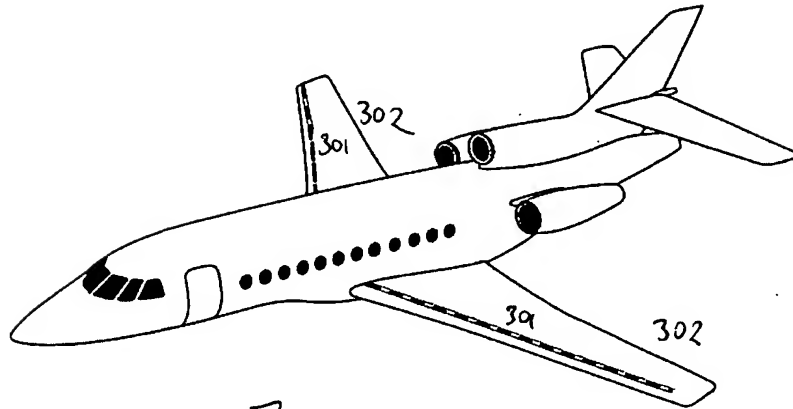


FIG. 3A

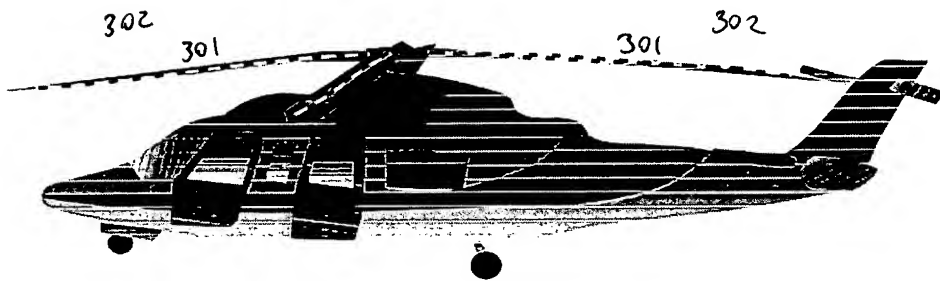
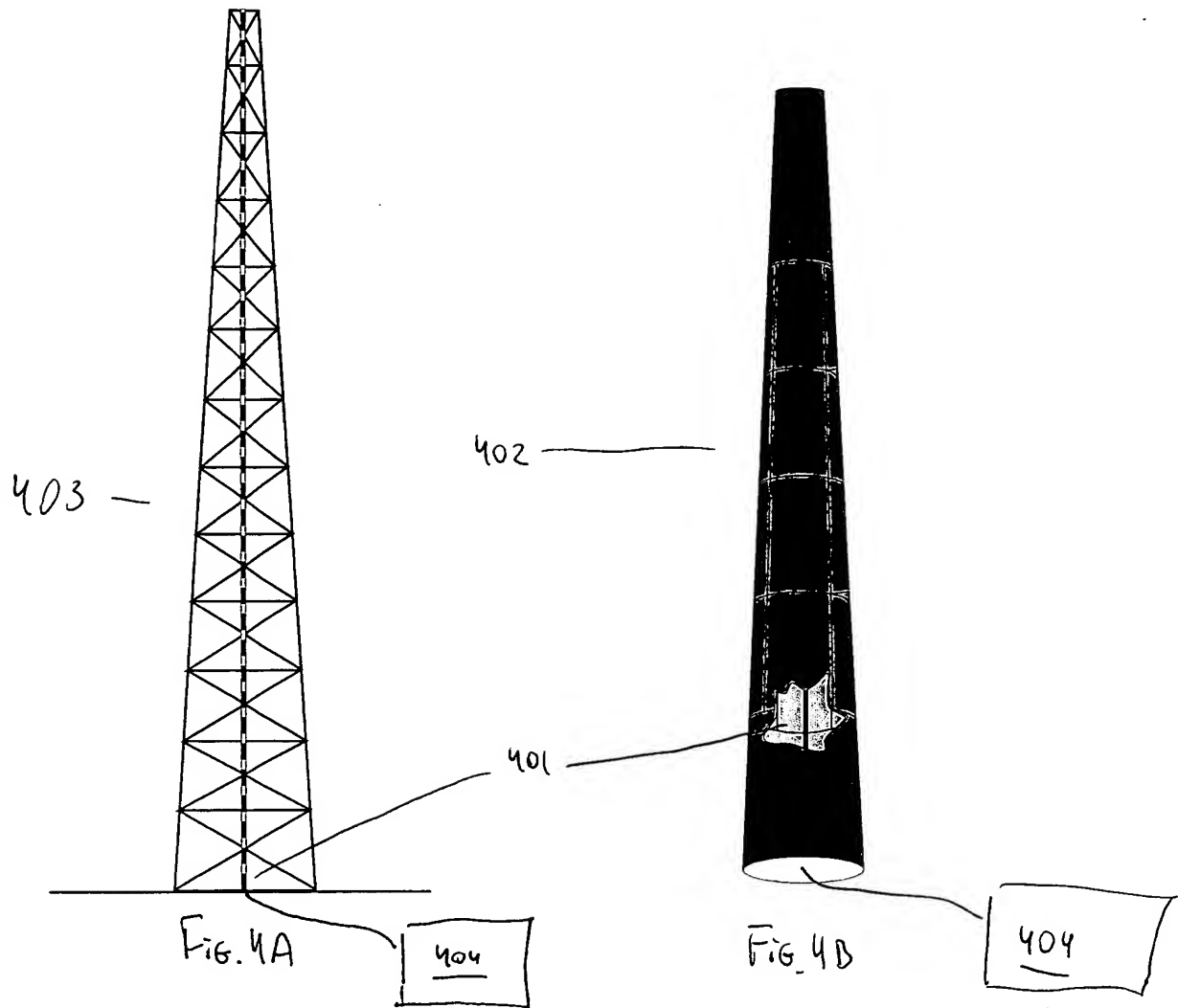
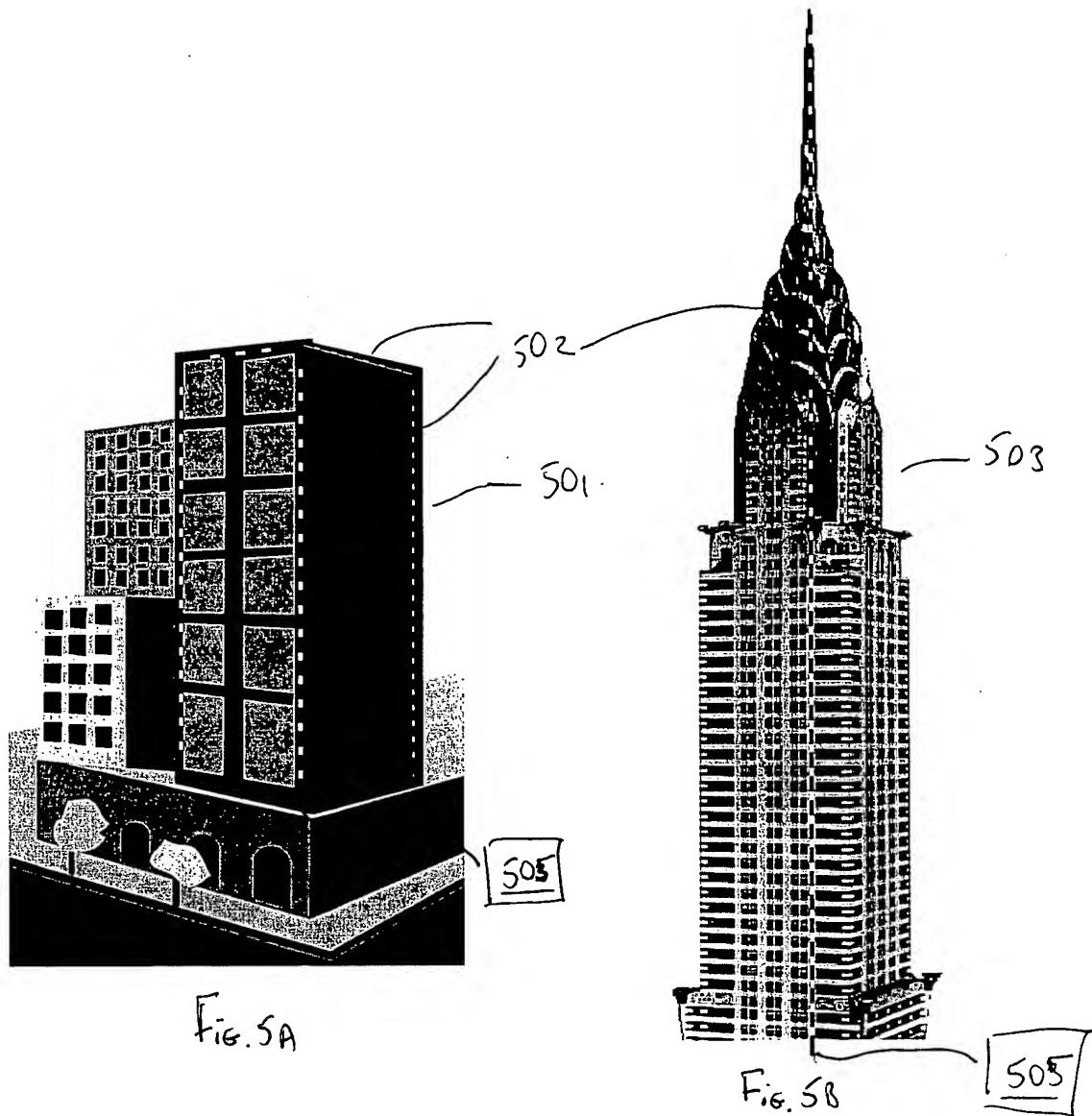


FIG. 3B AIRCRAFT APPLICATIONS



TOWER APPLICATIONS



BUILDING APPLICATIONS

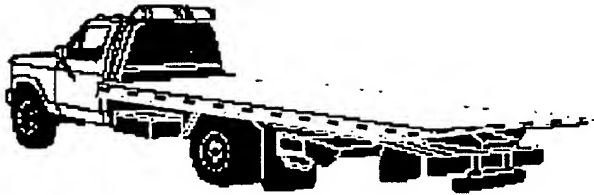


Fig 6A

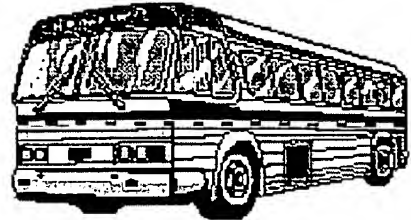


Fig 6B

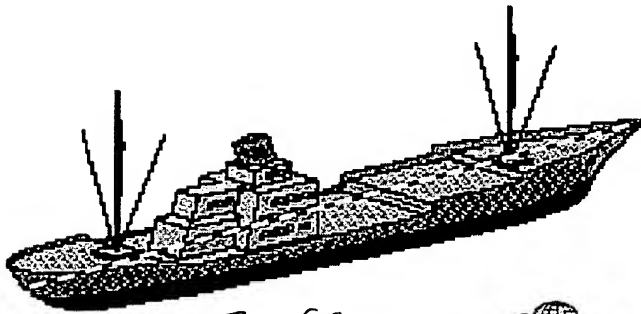


Fig 6C

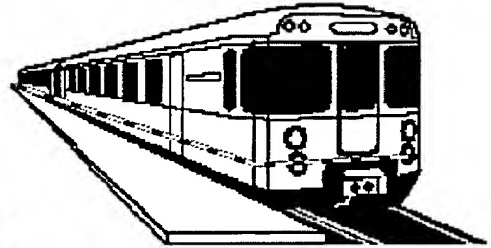


Fig. 6D

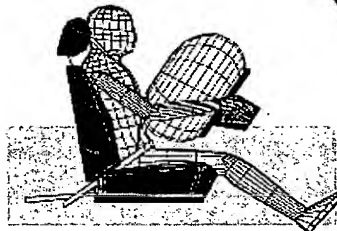


Fig. 6E

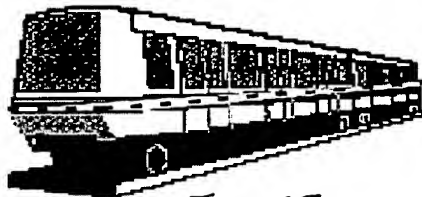


Fig. 6F

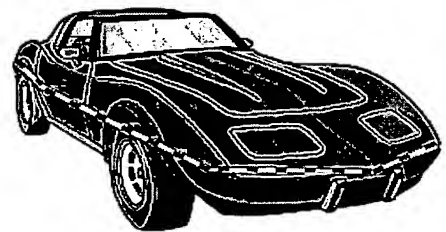


Fig 6G

TRANSPORTATION VEHICLE APPLICATIONS

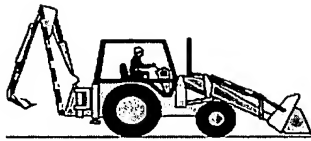


Fig. 7A

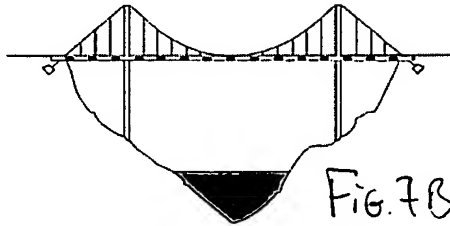


Fig. 7B

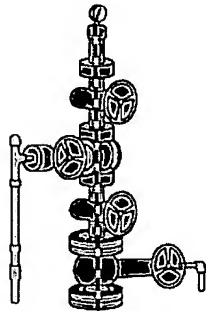


Fig. 7C

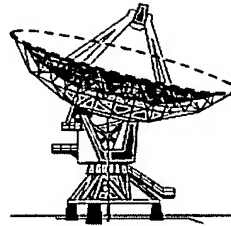


Fig. 7D

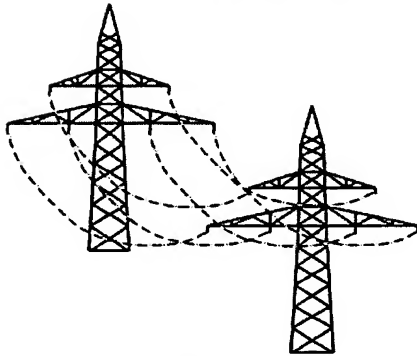


Fig. 7E

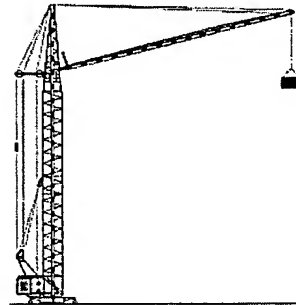


Fig. 7F

UTILITY LINE SAG MONITOR
AND OTHER CIVIL ENGINEERING USES

Figure 8. Single Segment Sensor Pair

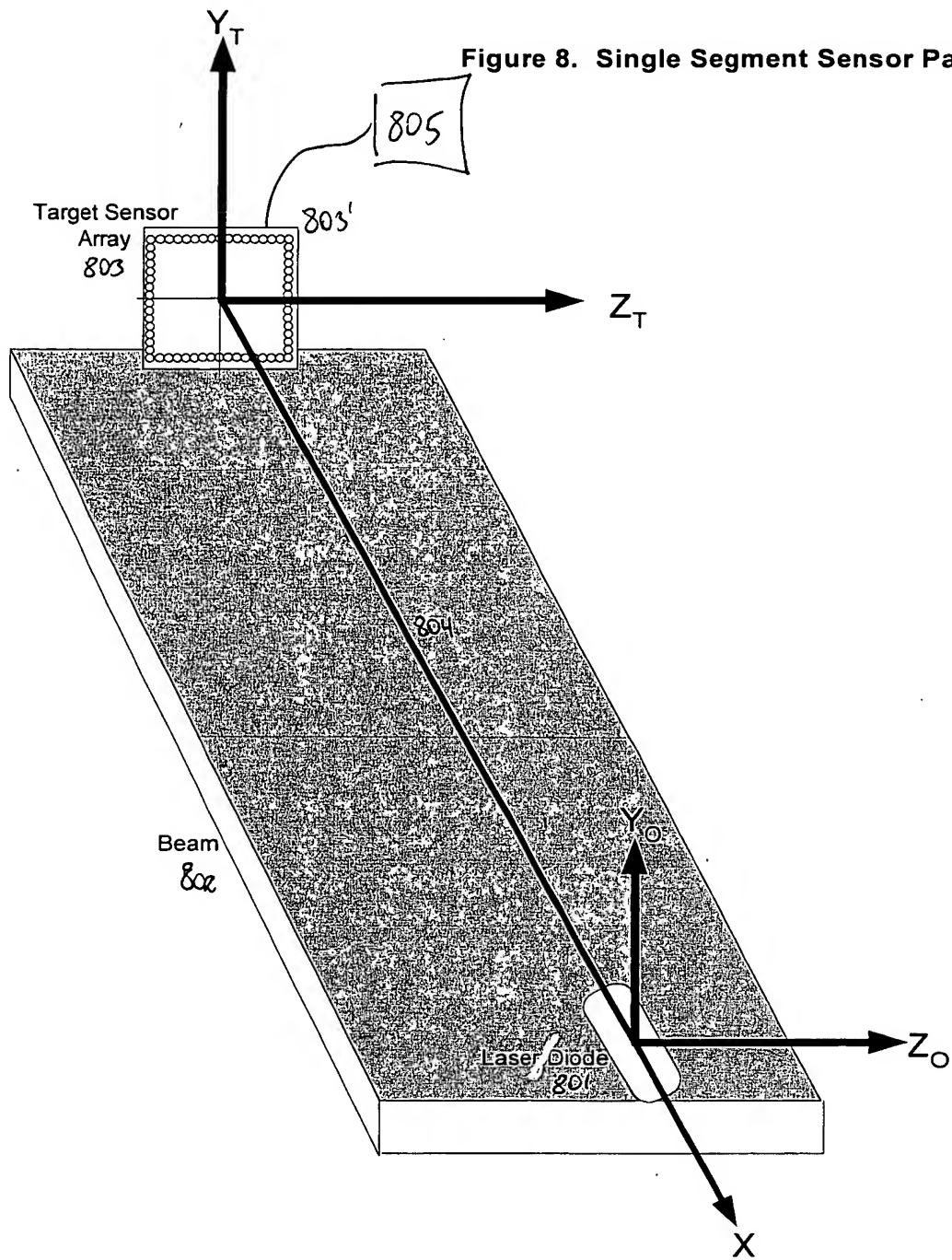
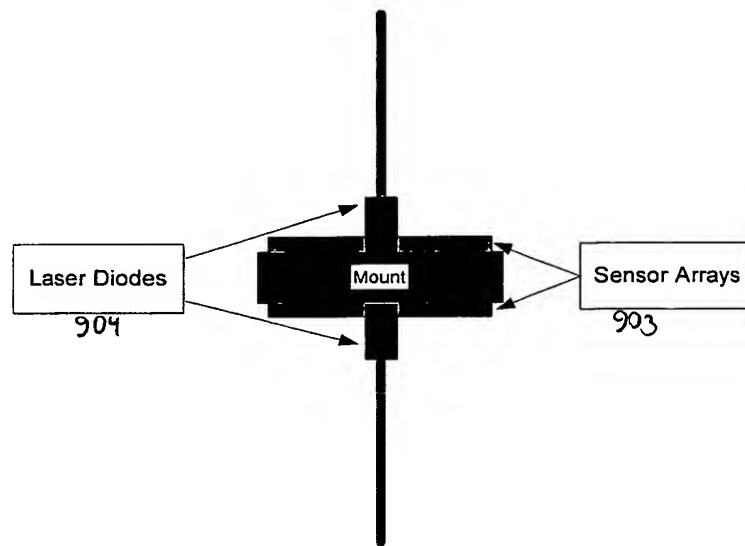
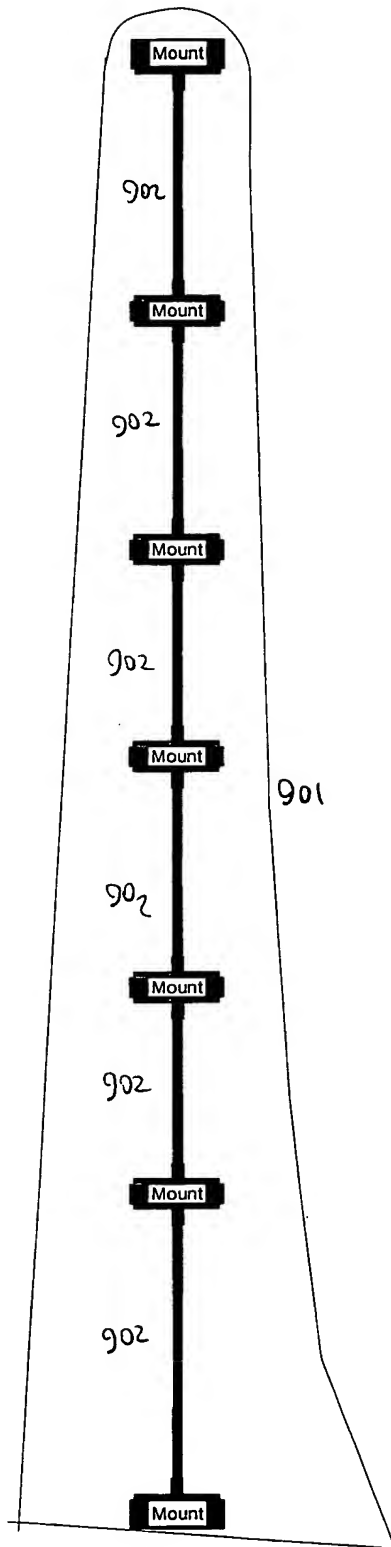


Figure 9.
Wing Planform With Multi-Segment Sensor Pairs



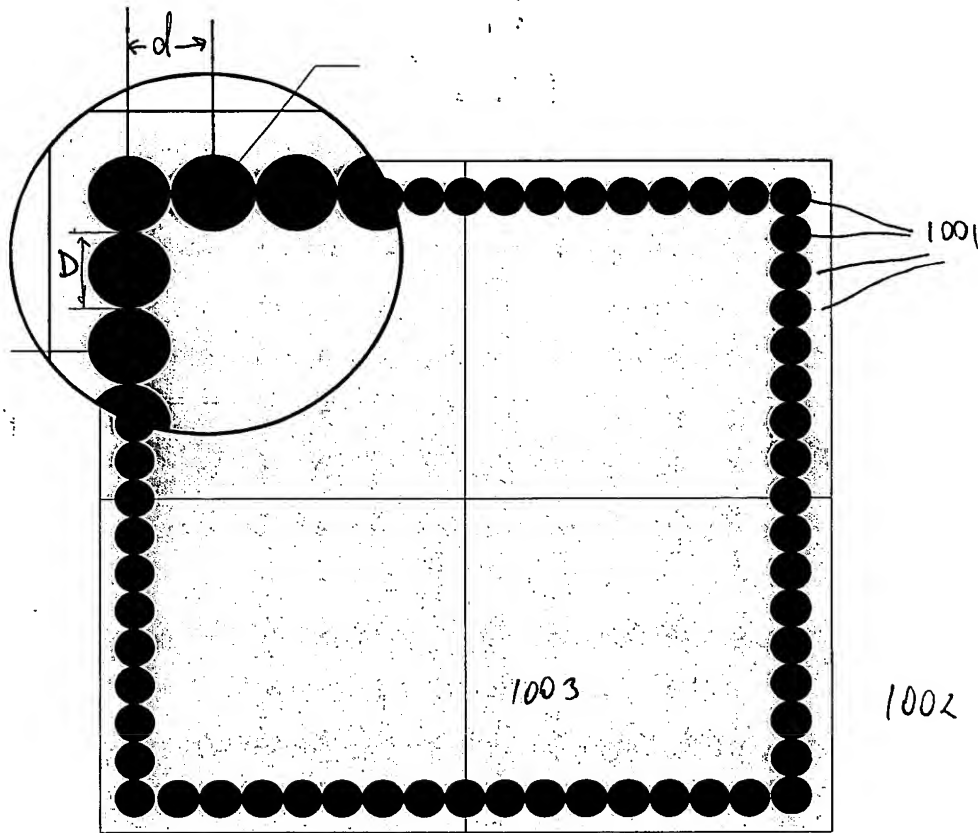


FIGURE 10: SENSOR TARGET ARRAY

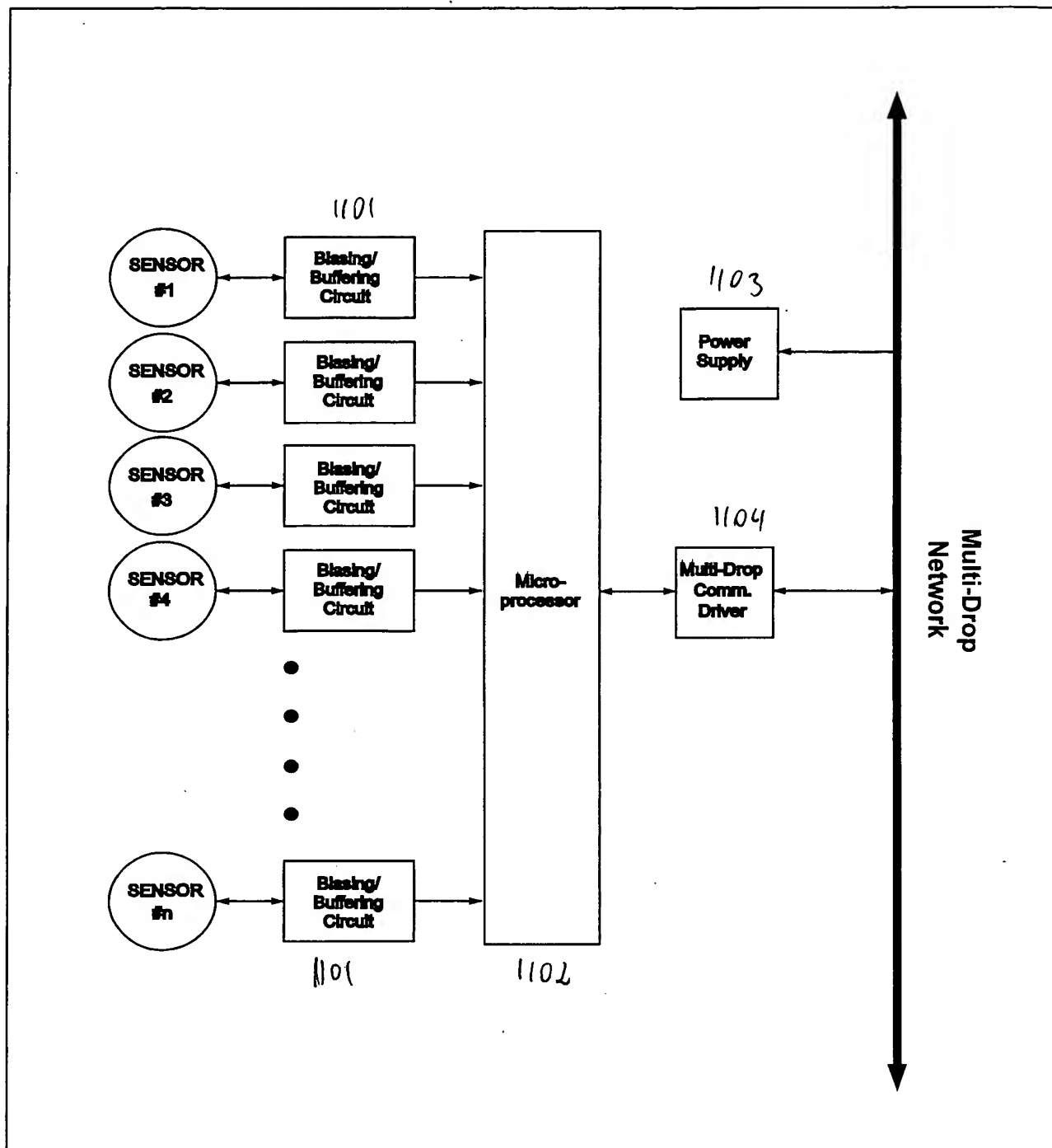


FIGURE 11: SENSOR CIRCUIT BLOCK DIAGRAM

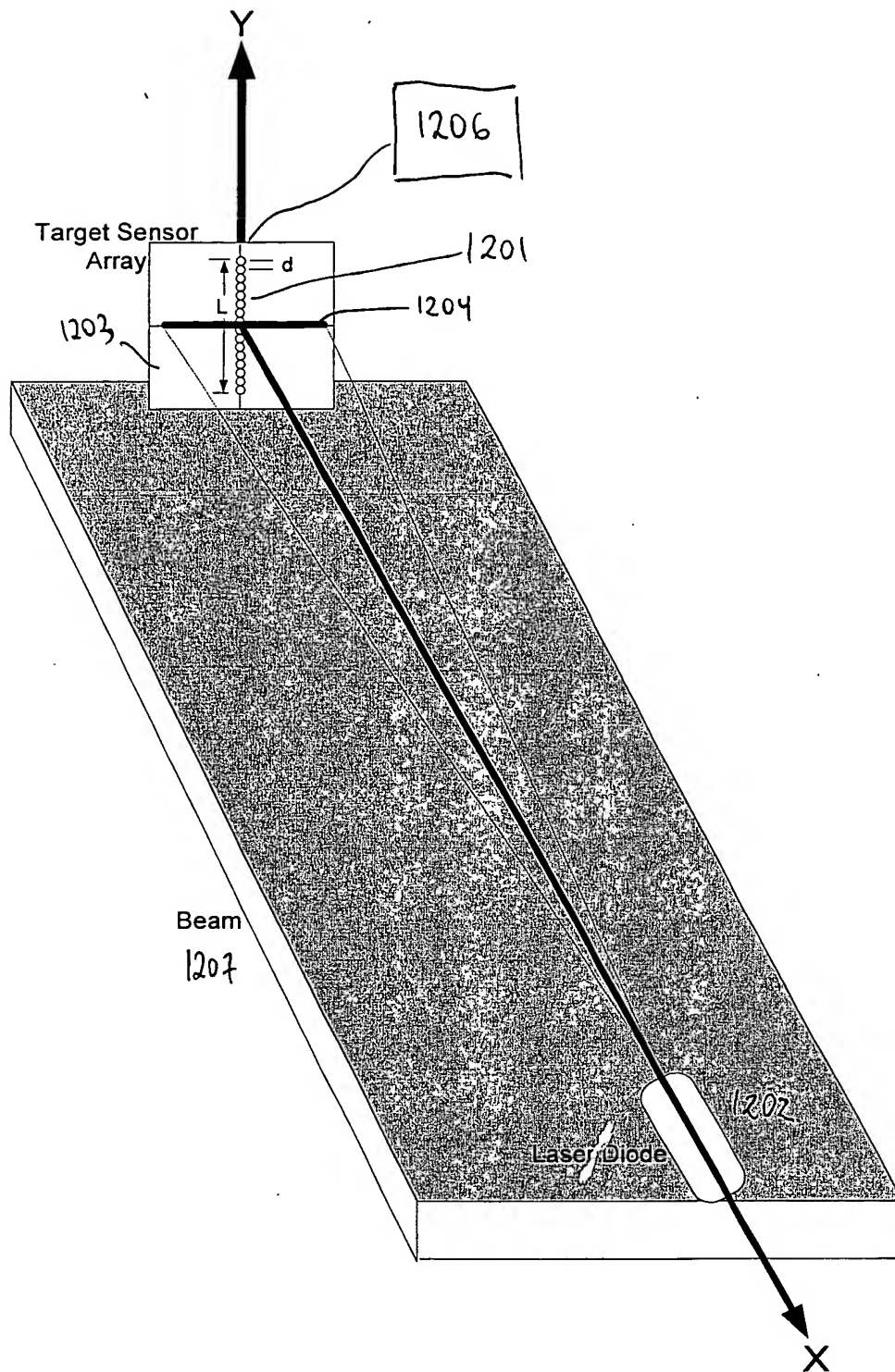


Figure 12.
Single Segment, Single Axis Measurement Isometric View

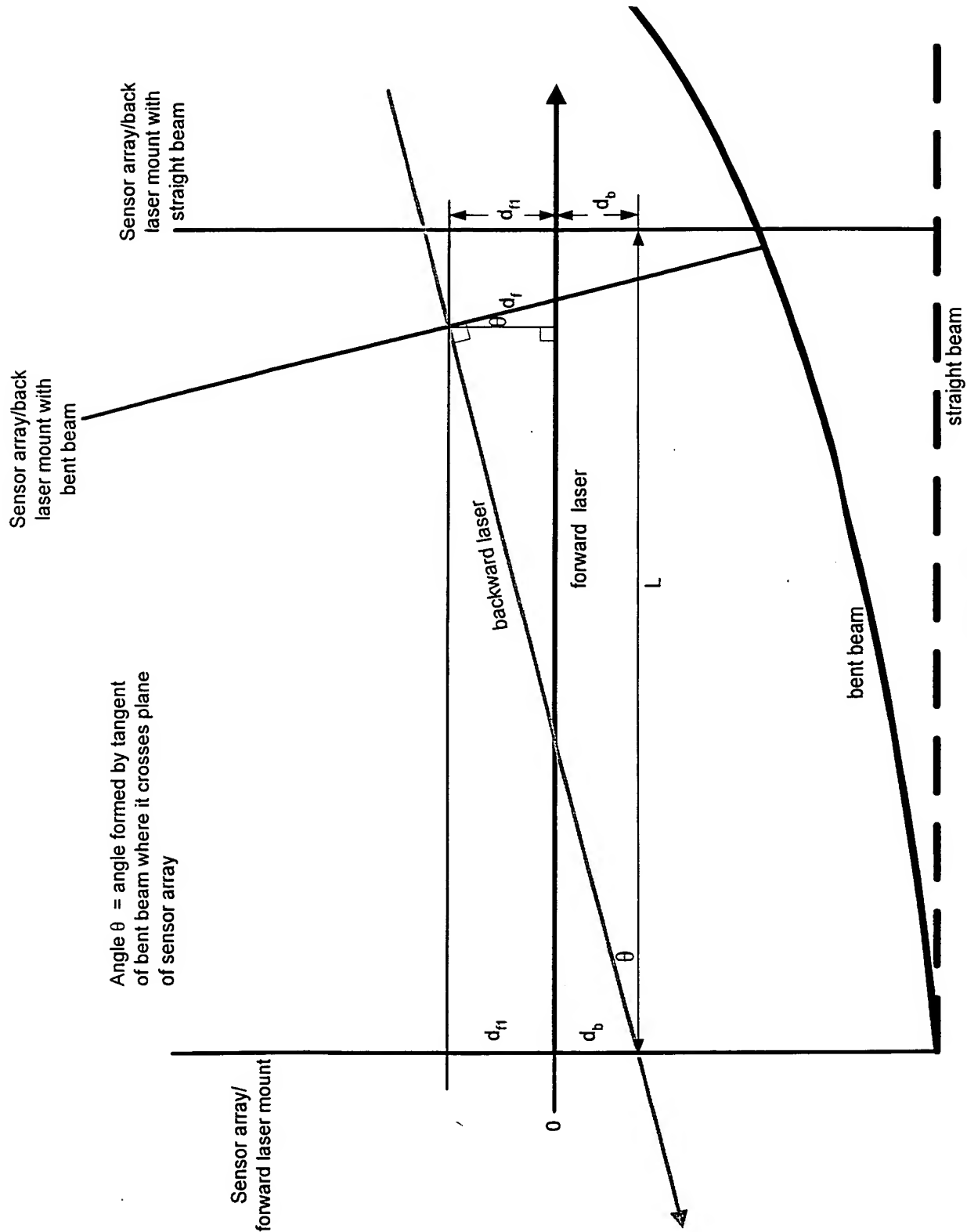


Figure 12A
 Segment with Sensor Arrays Showing Calculation of Tangent Angle of the Beam at the End of the Segment

Figure 13
 Deflected Beam with Three Sensor Segments

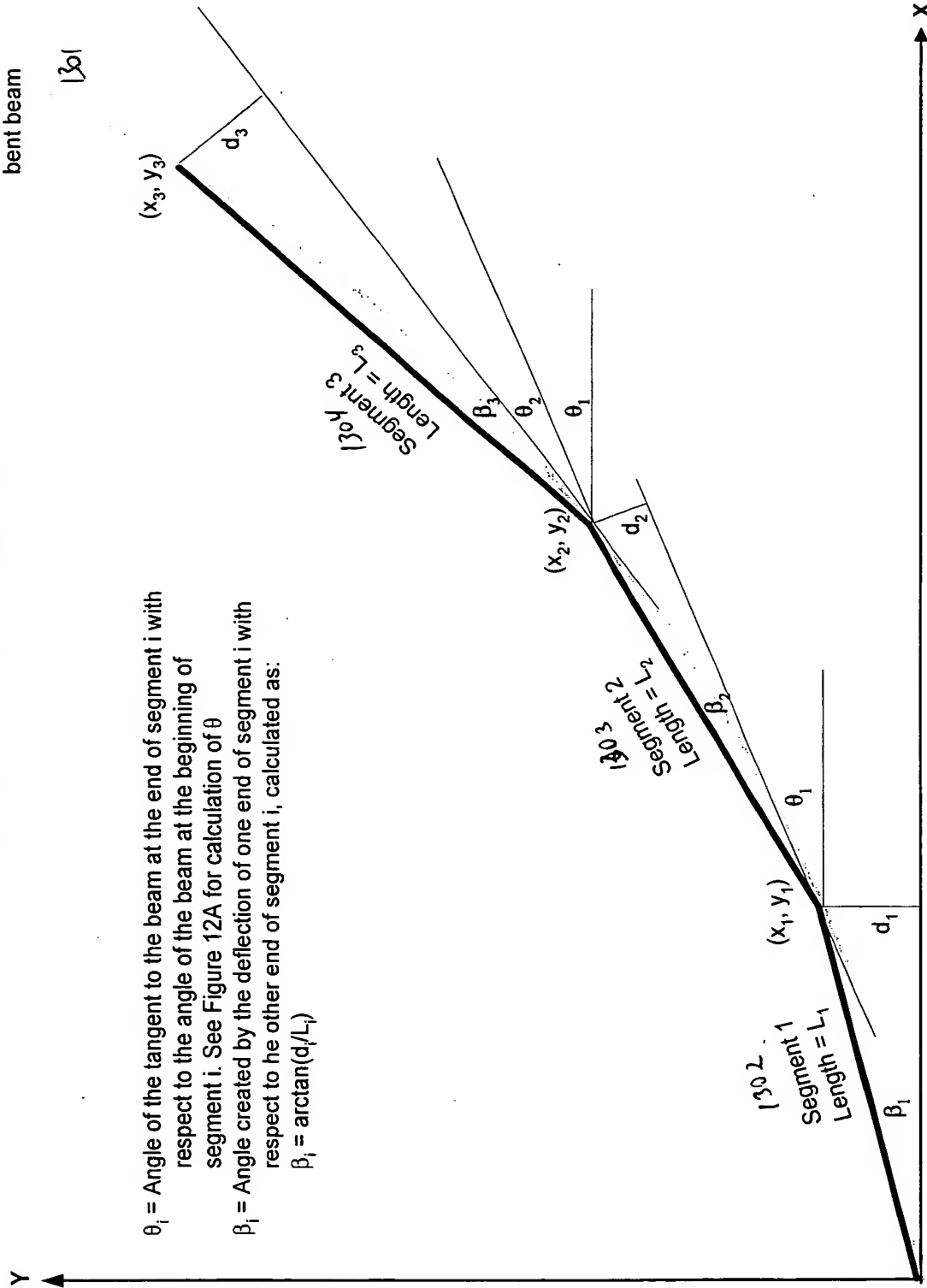
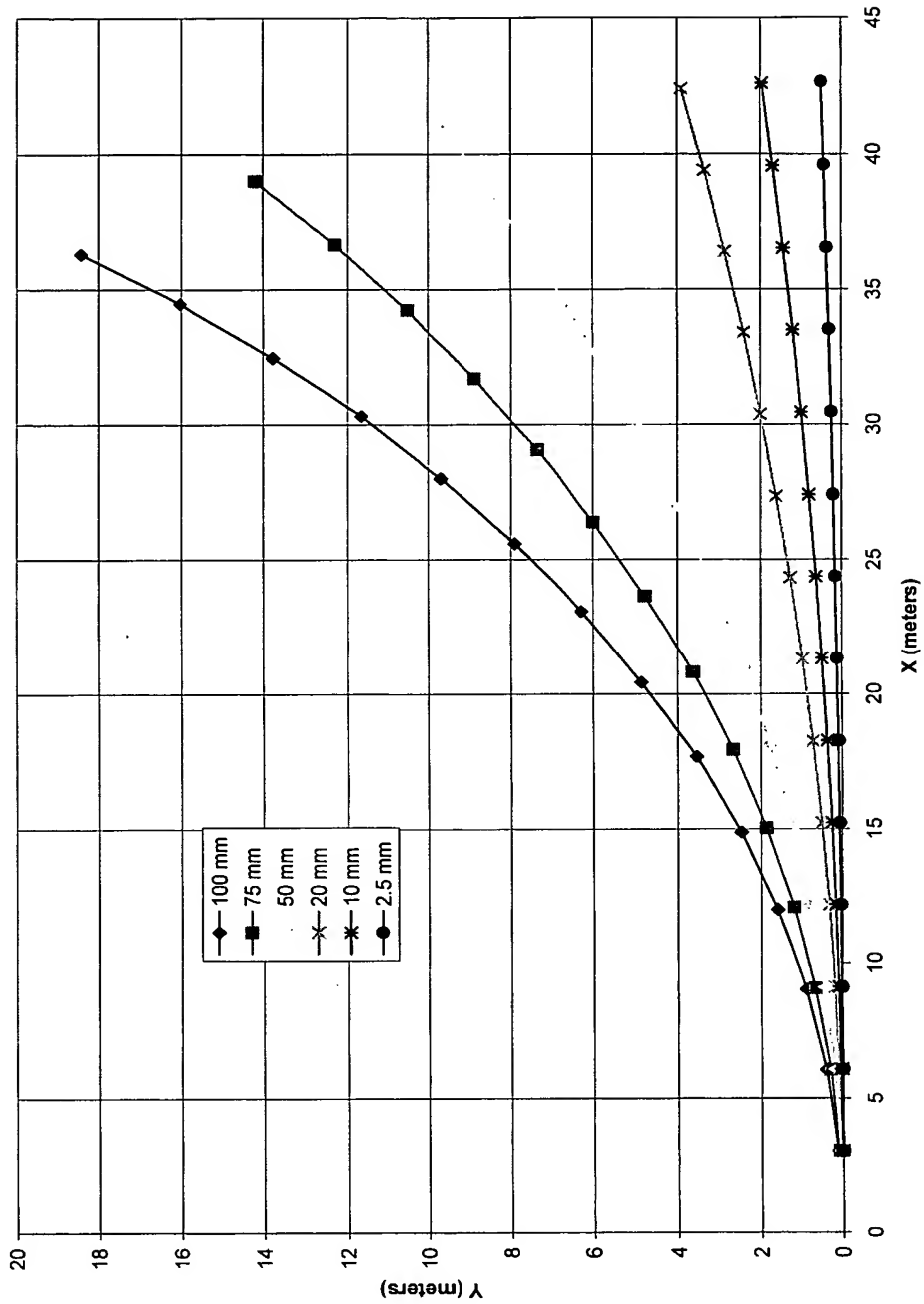


Figure 14. Linear Beam Shapes With Parametric Deflections
XY vs Constant Segment Deflection
14 segments each 3.048 meters (10 feet) long



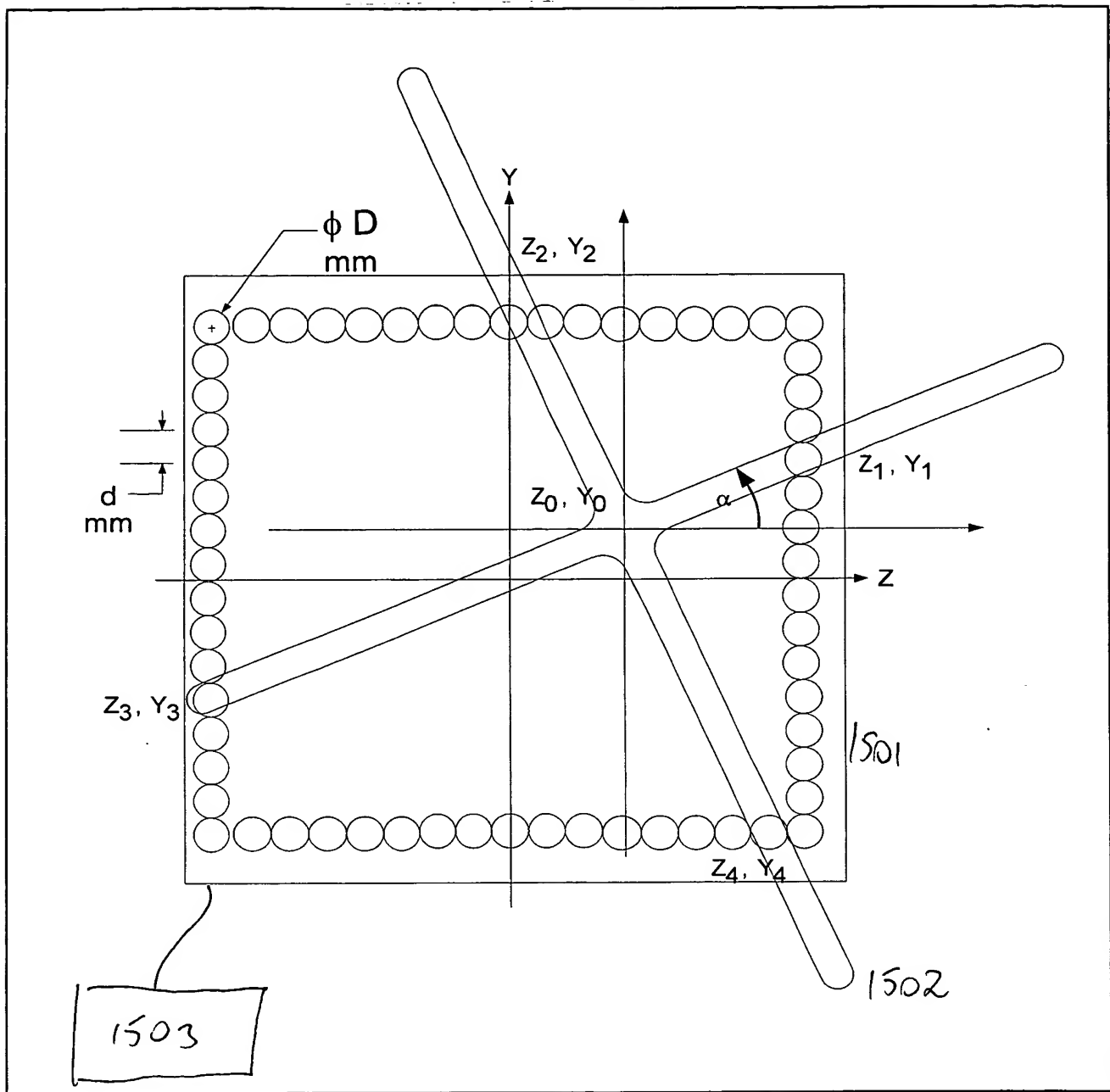


FIGURE 15: THREE-AXIS LASER CROSSHAIRS AND SENSOR TARGET

Figure 16. Simplified view of 3-axis segment

